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Appl. No. 10/500,305  
September 4, 2007

### **REMARKS/ARGUMENTS**

Reconsideration of this application is requested. Claims 19-41 are in the case.

Claims 19-41 stand rejected under 35 U.S.C. §103(a) as allegedly unpatentable over U.S. Patent 6,143,921 to Karim et al. This is the sole rejection in the case. The rejection is respectfully traversed.

The present invention is directed to an integrated process for the production of an alkenyl carboxylate. The process comprises the steps of (a) contacting in an oxidation reaction zone a C<sub>2</sub> to C<sub>4</sub> alkane, a molecular oxygen-containing gas, optionally the corresponding alkene and optionally water, in the presence of at least one catalyst active for the oxidation of the alkane to the corresponding alkene and carboxylic acid, to produce a first product stream comprising alkene, carboxylic acid and water; (b) separating at least a portion of the product stream from step (a) into a fraction comprising the alkene and a fraction comprising the carboxylic acid and water; (c) contacting in a second reaction zone at least a portion of said alkene fraction produced in step (b), a carboxylic acid and a molecular oxygen-containing gas, in the presence of at least one catalyst active for the production of alkenyl carboxylate to produce a second product stream comprising alkenyl carboxylate, water and carboxylic acid; (d) feeding the carboxylic acid and water fraction produced in step (b) and the product stream comprising alkenyl carboxylate, water and carboxylic acid from step (c) to a single distillation means; (e) separating at least a portion of the product stream from step (c) and at least a portion of the carboxylic acid and water fraction produced in step (b) by azeotropic distillation in the single distillation means into an overhead fraction comprising alkenyl carboxylate and a base fraction comprising carboxylic acid; and (f)

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recovering the alkenyl carboxylate from the overhead fraction separated in step (d).

The Action urges on page 5 that the difference between the process of the present invention and Karim is that Karim fails to explicitly teach a separation step of separating at least a portion of the carboxylic acid and water fraction produced in step (b) by azeotropic distillation into an overhead fraction comprising *alkenyl carboxylate* and a base fraction comprising carboxylic acid. This assertion is not understood. If the feed to the distillation column does not comprise an alkenyl carboxylate, the overhead from the column cannot comprise an alkenyl carboxylate. In the claimed process, the acid and water stream from step (b) is fed to the **same** distillation column as is fed the VAM/acid/water stream produced from the VAM reactor in step (c).

In the Karim process, the acid/water stream from step (b) is either fed to a distillation column (3) or is fed directly to a VAM reactor (5). The VAM/acid/water stream from the VAM reactor is fed to a distillation column (7). Thus, in contrast to the presently claimed process, the acid/water stream and the VAM/acid/water stream in Karim are fed to **different** distillation columns.

The Action states, on page 6, that:

"it is quite clear from figure 1 of Karim that a portion of the acid/water stream from the liquid gas separator is not fed to the first distillation column, but is fed directly to the vinyl acetate reactor. In this regard, the claims do not require that this stream be fed directly to the second distillation column. But rather, the claims only require that the acid and water from this stream be separated in the second distillation column, which is shown in distillation column (7) in figure 1 of Karim."

In Fig. 1 of Karim, a portion of the acid/water stream from the L/G separator (2) is fed directly to the VAM reactor. However, this is not relevant since nowhere in Karim is

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It suggested that the acid/water stream from L/G separator (2) is fed to the **same** distillation column (7) as the VAM/acid/water stream from the VAM reactor (5).

It is not correct that the claims "...only require that the acid and water from this stream be separated in the second distillation column, which is shown in distillation column (7) in figure 1 of Karim." In the present process, there is only required a **single** distillation column for the separation of **both** (i) the acid/water stream and (ii) the VAM/acid/water stream. In Karim, the acid/water stream is either fed to the VAM reactor and is therefore not separated and/or is fed to a distillation column (3) but this distillation column is not the same distillation column to which the VAM/acid/water stream is fed (i.e., distillation column (7)).

Karim clearly describes a different process to that as claimed. The present process requires feeding an acid/water stream from the separator of step (b) into the same distillation column as the VAM/acid/water stream from a VAM reactor. In Karim, the separation of the acid/water stream from the separator is carried out in a different distillation column to the one in which VAM/acid/water stream from the VAM reactor is separated. Applicant has surprisingly found that by carrying out the distillation of the two streams in the same distillation column, the amount of ethyl acetate by-product in the VAM product is significantly reduced (compare the results given in Table 2 and Table 3 on page 17 of the specification). Table 2 provides data for the distillation of the VAM/acid/water stream only. The amount of ethyl acetate in the VAM product is 0.46. Table 3 provides data for the distillation of the VAM/acid/water stream together with the acid/water stream. The amount of ethyl acetate in the VAM product is 0.006.

As Karim fails to suggest the distillation of the two streams in a single column, it

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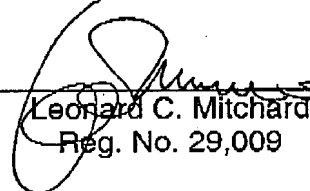
would not have been obvious from Karim that an improved vinyl acetate product could be achieved in the way realized by the presently claimed process. In light of the above, it is believed to be clear that one of ordinary skill in the art would not have been motivated to arrive at the presently claimed invention based on Karim. Absent any such motivation, a *prima facie* case of obviousness has not been generated in this case. Reconsideration and withdrawal of the outstanding obviousness rejection are accordingly respectfully requested.

Favorable action on this application is awaited.

Respectfully submitted,

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